DETAILED ACTION

Response to Amendment

Applicant's addition of claims 53-54 filed in the response on 2/16/10 is acknowledged.

Election/Restrictions

1. Newly submitted claims 53-54 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The membrane as set forth in original claims 20-23, 25-26, 28-31 and 41-50, and 52 can be made by other viable process including graft polymerization of vinyl-containing sulphonic acid and vinyl-containing phosphonic acid onto polymer film substrate.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 53-54 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Currently, claims 20-23, 25-26, 28-31 and 41-50, and 52 are under consideration in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 20-23, 25-26, 28-31, and 41-52 are rejected under 35 U.S.C. 103(a) as being unpatentable Formato et al. (US-469) for the reasons of record.

US 6,248,469 to Formato et al. discloses a solid polymer electrolyte membrane (SPEM) having a porous polymer substrate interpenetrated with an ion-conducting polymer material. Suitable polymer substrates include those containing at least one nitrogen, oxygen or sulfur atom in the recurring units encompassing the polymer expressed in step (a) of the present claims (col. 6, lines 22-50; col. 7, lines 1-29; col. 10, lines 9-18). Prior art preferred ion-conducting material includes at least one of the instant polyvinylsulfonic acid and polyvinylphosphonic acid (col. 7, lines 10-28; col. 14, lines 31-41). The resultant membrane has ion-conductivity of greater than 0.1 S/cm even above temperatures of at least about 100°C

(col. 12, lines 58-67). One of the prior art embodiments in producing the membrane comprises the step of preparing the substrate polymer and subsequently impregnating the substrate with the chosen ion-conducting monomers, which are then polymerized in situ to form the composite SPEM (col. 8, lines 30-34; col. 15, lines 5-12; col. 17, lines 22-45). US-469 discloses using at least one of the instant vinylsulfonic acid and vinylphosphonic acid monomers within the scope of the present claims, but does not expressly exemplify the use of both type of monomers as the ion-conducting monomers. The examiner is of the position that it would have been obvious to one having ordinary skill in the art to employ both vinylphosphonic acid and vinylsulfonic acid ion conducting monomers for the expected additive result in light of their having been discloses as suitable ion conducting monomer alternatives by patentees. Absent evidence of unusual or unexpected results, no patentability can be seen in using a mixture of two ion conducting monomers wherein each is used for the same purpose by the patentees. Prior art further teaches an optimal interpenetration of the polymer substrate by the ion-conducting polymer to be in the range of 40-90% volume, and exemplifies percent sulfonation within those expressed in the present claims (col. 18, lines 13-15; working examples). Once the in-situ

polymerization of vinylsulfonic acid and vinylphosphonic acid in the presence of a polymer film substrate to form a composite SPEM is suggested, the determination of optimum or workable ranges of the respective components within prior art general conditions would involve only routine skill in the art. Furthermore, the present claims are presented in a product-by-process format. Thus, the patentability of the claimed invention is determined based on the product itself, not the method of making it. It is well settled that if the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process. In the instant case, applicant's method and reactants are substantially the same as those in prior art in-situ polymerization method. Accordingly, the same product is expected to be formed. In any event, even if the respective methods are different, when applicant's product and that of the prior art appear to be identical or substantially identical, the burden shifts to applicant to provide evidence that the respective products do in fact differ, and that prior art product does not necessarily or inherently possess the relied upon characteristics of applicant's claimed product.

Response to Arguments

Applicant's amendment and remarks filed on 2/16/10 have been fully considered. Applicant repeated much of the argument that the polymer substrate of Formato et al. is materially different from the recited polymer in step (a) because it is porous, and therefore, the composite membrane resulting from prior art method is different from the claimed membrane. The examiner respectfully disagrees and has fully considered the structure of the product implied by the process steps. The present claims are directed to a membrane produced by the steps of mixing a polymer with vinyl sulfonic acid and vinyl phosphonic acid monomers and subsequently polymerize the monomers in-situ to produce a membrane. This is in essence what prior art in-situ polymerization embodiment teaches. The argument with respect to the entire bulk of the recited polymer in step (a) being imbibed with monomer solution, as compared to prior art being limited to only the void regions is not persuasive because applicant's polymer as claimed is not only limited to a non-porous polymer as asserted, and thus, encompassing prior art polymer substrate having any degree of porosity. It is the claims, not arguments or conclusory statements, which defined applicant's invention, and as such the recited polymer in step (a) is indistinguishable from prior art

polymer substrate. Finally, the alleged unexpected advantage of the claimed membrane showing conductivity at high temperature is not found to be persuasive or unexpected as US-469 clearly discloses high ion-conductivity of greater than 0.1 S/cm, even at temperature of at least about 100°C (col. 12, lines 52-68). Accordingly, the examiner's position is maintained.

4. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen L.

Pezzuto whose telephone number is (571) 272-1108. The examiner can normally be reached on 8 AM to 4 PM, Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Helen L. Pezzuto/
Primary Examiner
Art Unit 1796

hlp